

LAND USE ANALYSIS

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LAND USE ANALYSIS

I. INTRODUCTION

A land use analysis is an important element of community planning. Once raw land is converted to a particular use, it is usually committed to that use for a very long time, if not indefinitely. It is extremely difficult to change a pattern of development once it takes hold. Therefore, decisions about future land use should be made carefully, with a studied eye to the potential ramifications of those uses. A well-conceived land use plan allows for new growth and development while it protects and preserves the integrity of neighborhoods, businesses, transportation routes, and the environment.

This chapter describes the pattern of existing land uses in Greenfield and analyzes the changes that have taken place in the land use pattern since 1985, the date of the last Master Plan for Greenfield. Maps are used to identify the areas of town that have been developed, the kind of development that has occurred, and the relationship of one land use to another. This information provides the baseline necessary to evaluate the appropriateness of future development and the availability of suitable land for such development.

The development of a land use plan forms the basis of land use regulations, which are effected through zoning ordinances, subdivision and site plan review regulations. The land use plan describes the goals and objectives envisioned by the town; the regulations are the means to put these goals and objectives into place. For instance, if in the process of describing present land use patterns in Greenfield, recommendations are made to encourage more commercial activity in a particular area, the zoning ordinance should be amended to permit that kind of activity in that location - if it does not already do so. Or, by the same token, the land use plan might recommend that the zoning ordinance be made more restrictive in particular areas, for the purpose of protecting and preserving certain natural features in town.

II. LAND USE CATEGORIES

The first step in the land use analysis is to classify the various land uses that exist in Greenfield. A classification system describes these activities. The second step is an analysis of tax assessing data from Greenfield using Geographic Information System (GIS) technology. Existing land uses and activities are recorded on a map to illustrate an interpretation of the land use pattern.

In general, land is classified according to its physical characteristics and/or the present activity that occurs on it. The two major divisions in a land use classification system are "Developed" and "Undeveloped" uses. Each of these divisions can be further subdivided into specific land uses. The following is a listing and description of the standard land uses categories used to prepare a Land Use Plan:

◆ **Residential:**

All land and/or structures used to provide housing for one or more households. These include site-built single family homes, manufactured homes (previously known as mobile homes), factory-built modular homes, duplexes, apartment buildings, condominiums, and seasonal residences.

- ◆ **Government/Institutional:** Establishments and facilities supported by and/or used exclusively by the public or non-profit organizations, such as fraternal, religious, charitable, educational and governmental facilities.
- ◆ **Agricultural:** Lands that are utilized for the cultivation of crops, the raising of livestock and poultry, and nurseries for horticultural purposes.
- ◆ **Commercial:** All lands and structures that supply goods and/or services to the general public. This includes such facilities as restaurants, motels, hotels, service stations, grocery stores, furniture and appliance sales, as well as establishments which are primarily oriented to providing a professional and/or personal service to the public, such as medical offices, banks and financial institutions, personal care establishments, etc.
- ◆ **Industrial:** Land and/or facilities used for mining, construction, manufacturing, treatment, packaging, incidental storage, distribution, transportation, communication, electric, gas and sanitary services, and wholesale trade.
- ◆ **Home-Based Business:** A residential property that houses a home occupation or home-based business. The residence continues to be the principle use of the land, and the occupation is by definition secondary and incidental.
- ◆ **Road network:** All public and private rights-of-way that are designated for carrying vehicular traffic. This includes Class VI roads that are no longer maintained by the town and do not carry public traffic.
- ◆ **Protected Lands:** Included in this category are all federally-owned lands, all State parks and forests, land protected under the State Land Conservation Investment Program (LCIP), land protected and/or owned by the town, sensitive land and wildlife habitats protected by the NH Audubon Society, land held by the Society for the Protection of NH Forests and the Monadnock Conservancy.
- ◆ **Undeveloped:** All lands that are not developed for any of the above uses, regardless of the reason - whether it be because the land is not usable due to environmental constraints, or there has been no demand to develop.

III. FACTORS THAT INFLUENCE LAND USE

Various factors influence growth and development in a town. The major physical and topographic features are the primary factors that influence the initial as well as the subsequent development of land. Secondary factors usually consist of man-made features such as roads, railroads, utilities and major commercial, industrial or recreational facilities that attract and/or stimulate new or expanded development. The following factors have played an important role in the development of Greenfield:

Waterfront Development

Greenfield is home to several major waterbodies; Hogback Pond, Otter Lake, Powder Mill Pond, Sunset Lake, Mud Pond and Zephyr Lake. These waterbodies are classified by the NH Department of Environmental Services as Public Waters, which means that they are subject to the State's Comprehensive Shoreland Protection Act (RSA 483-B). This law was enacted in 1991, and establishes standards for the subdivision, use and development of the land around the state's public waters, defined as all land located within 250 feet of the water.

Although Greenfield is home to these waterbodies, only a limited amount of residential development has occurred around them, with the exception of Sunset and Zephyr Lakes. High density residential development has occurred along portions of these two lakes. The limited amount of development along the other waterbodies is due to the efforts of the Town to protect the quality of these waters. The Town owns a small parcel on the western shore of Sunset Lake as well as a parcel on the east shore of Zephyr Lake, and Hogback Pond. Mud Pond and a portion of Otter Lake are located within Greenfield State Park. Nonprofit institutions such as the Barbara C Harris Camp and conference center and Crotched Mountain own large parcels on Otter Lake and Sunset Lake. There is a boat launch area on the south side of Forest Road owned by the State.

Transportation Systems

Settlement in Greenfield has been influenced by three major roads; NH Route 136, Forest Road, and NH Route 31. Major Collectors are designed to move medium traffic volumes at medium speeds between or within communities. They differ from the Arterial system in that collector streets go through residential neighborhoods, distributing traffic from the arterials through the area to its ultimate destination. Minor Collectors provide alternate routes to Major Collectors.

Within Greenfield Route 31 (Sawmill Road), Forest Road, and Route 136 are classified as Major Collectors. There are no Arterials or Minor Collectors in Greenfield.

The other transportation system that influenced the settlement pattern of Greenfield is the railroad, which runs across town from the southeast to the northwest. Until the summer of 1986, Greenfield was served by the Hillsborough Branch of the Boston & Maine Railroad, which provided freight service to and from local industries. The railroad initially served a much greater role in moving people and goods around and through Greenfield than did the road network. Thus, the demise of rail travel and the establishment of major transportation routes outside of Greenfield's boundaries set in place certain parameters that have dictated the rate and type of development experienced in Greenfield over the last several decades. Another factor that could change the landscape in Greenfield and elsewhere is the introduction of telecommuting, which does not require concrete and asphalt for people to travel to their places of work. The effect this is having on the development pattern in Greenfield remains to be seen.

Topography & Soils

To some extent, topography and soils also play a role in any town's development. Historically, people built houses and roads on land that was most easily accessed; and soil type and characteristics influence what kind of development will occur - farming, for example, and where that development will take place.

The topography of Greenfield is dominated by Crotched Mountain in the north and North Pack Monadnock in the south. Crotched Mountain lies in the three towns of Greenfield, Bennington, and Franconia. The mountain's highest elevation is actually in Franconia (2,020 feet above sea level); in Greenfield the highest elevation is 1500 feet, in the northeasterly corner of the town, going down to 900 feet at Sunset Lake.

North Pack Monadnock has the highest elevation in town, ranging from 1,300 feet at Mountain Road up to over 2,200 feet at the highest point just north of the Temple town line.

Gould Hill in the south-central part of town and Blanchard Hill on the eastern side of town are two other concentrated areas of high elevation, although they do not exceed 1,200 feet. The western and central parts of town have the lowest elevations, ranging from 700 to 900 feet above sea level.

IV. EXISTING LAND USE

An analysis of the present land use pattern in a town is one of the first steps in the formulation of a Land Use Plan. Since the type and intensity of existing land uses have a strong influence on future development patterns, it is important to understand how land and other resources are used within a given area before recommendations can be developed relative to future land uses.

A Brief History

The Development of the Town of Greenfield's land has gone through several changes as economic emphasis has shifted from one period to another. Greenfield was first settled around 212 years ago, and for the next one hundred and fifty years the Town, like so many of its neighbors, was primarily an agricultural community. By the mid-1800's, over 80% of Greenfield's land was cleared and used for grain and hay fields, pastures, orchards, and vegetable gardens. Dozens of dairy and poultry farms shipped large quantities of milk and eggs as far as Nashua and Boston. Other products shipped included apples, potatoes, cordwood, and lumber.

By the early 1900's, America had developed an extensive and efficient system of railroads. This, coupled with advances in refrigeration, enabled perishable agricultural products to be shipped long distances. Greenfield's dairy farms, working the rocky and hilly New Hampshire soils, found themselves competing with the agriculturally rich Midwest. It was a competition they couldn't meet and gradually the farms were abandoned.

Because of the lack of swift rivers and brooks necessary for the water-powered mills of the 1800's, Greenfield never developed a large industrial base. There were, from time to time, many small mills, but their primary purpose was to support the needs of the local community. The railroad came to Greenfield in 1874, but almost all of its freight traffic was agriculturally related.

The automobile oriented economy of today has changed many of the traditional development patterns of the past. Old mansions have become tourist homes; businesses have infiltrated residential areas; and road intersections are often dominated by gasoline stations. Businesses oriented to the highway traveler follow the approach roads to the community, crowding on right-of-way originally laid out for "horse and buggy" use, and now oftentimes inadequate for the increasing volumes of automobile traffic.

As the commercial and industrial centers of its neighboring towns of Peterborough and Jaffrey, as well as cities to the east, grew and prospered, Greenfield began to change from a New England farming and mill town to a suburban “bedroom” community and recreationally oriented area. This is the character of Greenfield as it is today.

Greenfield’s Land Use

Analysis of the *Existing Land Use* map found on the following page verifies the pattern of development described above. Note that the residential uses occurring in Greenfield’s town center, with later residential development and most of the subdivisions locating on the roads leading out of Town, suggests that the more recent growth has been related to commutation to nearby towns. The center of Town is where many of the public buildings and much of the older housing is located. This concentration was undoubtedly the nucleus of an agrarian society developed around local farms and functioning as the hub of the community until later changes including institutional, recreational, and second home uses moved much of the land uses out of the center.

Greenfield has a land area of approximately 26.2 square miles, or 16,778 acres. Surface water accounts for approximately 350 acres. Of this land area, roughly 31 percent is presently developed for one of the uses described earlier in this text.

A review of the *Existing Land Use* map in terms of specific uses indicates the following:

Agricultural – Although primarily a suburban town, Greenfield has some 211 acres of land devoted to farming in many of its forms. These are scattered throughout town in several concentrations such as the Blanchard Hill section and areas just outside the center of Town. The number of acres of land devoted for agricultural use has decreased from 600 acres in 1980 as reported in the 1986 Master Plan. In Greenfield, as in most of the towns in the region, there are individual garden plots servicing the needs of local homeowners. These uses have not been considered of major agricultural significance in documenting the land use in this chapter of the Master Plan.

Residential – Residential development in Town is mostly single family detached homes and manufactured housing, with an infrequent occurrence of two family and multi-family housing. Also of significance in terms of concentrated residential development are the areas around Sunset and Zephyr Lakes where residential density is higher than in other parts of Town. In general, residential use occurs along the existing road network and is devoted to Single family homes. Approximately 1,326 acres of Greenfield’s land is in residential use, which is a 342% increase since 1980.

Commercial/Industrial – The major concentration of commercial and industrial uses is located in and around the town center. There is a limited amount of commercial development found along NH Route 31 in the southern portion of Town. The number of acres devoted to these uses has increased from 7 acres in 1980 to 36 acres in 2003.

Government/Institutional - Government/institutional uses are generally concentrated in the village center and are represented by the Town Office Building, the Fire Station, the Meeting House, and the Post Office. These uses are identified on the *Existing Land Use Map* as being tax exempt. The schools, cemeteries, and the large tracts used by the Crotched Mountain Rehabilitation Center, Brantwood Camp and Lyris, and by Barbara C. Harris Camp and

Conference Center are also included in this land use category. Some of these are considered mixed uses, such as the Camp Union area which operates both as an “educational” facility and a “recreational” area.

Recreational – Greenfield’s 2003 tax assessing data does not include recreational uses as a separate land use category. Recreational uses are incorporated in the Exempt categories (municipal, state, and federal). Recreational land in Greenfield includes the fairgrounds, the elementary school playground, a part of North Pack Monadnock Mountain, the Greenfield State Park, the beaches of Sunset and Zephyr Lakes, and several private camps.

Roads and Highways - Roads and highways, while not typically thought of as a "use" per se, do take up nearly 370 acres of land.

Attempting to calculate exact acreages for land uses - particularly residential usage, is difficult and time-consuming. Therefore, a commonly-used methodology is to simply assume two acres per each dwelling unit or use other than government/institutional, farmland, and vacant land. For residential uses, this takes into account that multi-family units will typically occupy much less than an acre and most single family homes much more than an acre. It is common for more of a lot to be taken up by a non-residential use than is generally observed for residential uses. The analysis of existing land use in Greenfield in 2003 was performed using Geographic Information System (GIS) technology with 2003 tax assessing data from the Town. The 2003 tax assessing data from the Town of Greenfield breaks land uses into the following categories:

- ◆ 1F Residential Waterfront
- ◆ 1F Residential
- ◆ 2F Residential
- ◆ 3F Residential
- ◆ 4F Residential
- ◆ Commercial
- ◆ Exempt – Municipal
- ◆ Exempt - Nonprofit
- ◆ Exempt – Federal
- ◆ Exempt – State
- ◆ Farmland
- ◆ Managed Hardwoods
- ◆ Managed Other Woods
- ◆ Managed White Pine
- ◆ Unmanaged Hardwoods
- ◆ Unmanaged Other Woods
- ◆ Unmanaged White Pine
- ◆ Wetland

The managed and unmanaged forest land categories have been combined into one category called undeveloped land. The land area taken up by roads and highways is calculated by assuming a 50-foot right-of-way, multiplied by the number of miles of road.

This methodology was used to develop the 2003 portion of the following table. An attempt has been made here to compare the uses of land in 1980 to that of 2003. A direct comparison, however, is not possible, due to differences in methodology. The largest percentage by far of

land in Greenfield remains undeveloped and, based on certain criteria, remains undevelopable. The table below compares the estimates of land use between 1980 and 2003.

Existing Land Use in Greenfield, 1980 and 2003

LAND USE	TOTAL ACRES		% OF DEVELOPED LAND		% OF TOTAL LAND	
	1980	2003	1980	2003	1980	2003
DEVELOPED:						
Residential (all classes)	300	1,326	9.2	25.9	1.8	7.9
Commercial/Industrial	7	36	0.2	0.7	.04	0.2
Government/Institutional	962	--	29.4	--	5.7	--
Exempt (Municipal, State, & Federal, Private/Institutional)	--	3,169	--	62.0	--	18.9
Recreational	1,025	--	31.3	--	6.1	--
Agricultural	600	211*	18.3	4.1	3.6	1.3
Roads and Highways	377	370	11.5	6.8	2.2	2.2
TOTALS	3,271	5,112	100	100	19.4	30.5
TOTAL LAND AREA	16,778	16,778			100	100
TOTAL DEVELOPED LAND	3,271	5,112			19.4	30.5
TOTAL SURFACE WATER	350	350			2.1	2.1
TOTAL UNDEVELOPED LAND	13,157	11,316			78.5	67.4

* - Data from 2/3/03 Current Use Report

Sources: 1985 Master Plan for Greenfield, 2003 Tax Assessing Data from the Town of Greenfield

As can be seen from the preceding table, the greatest use of land in Greenfield in 2003 is land that is exempt (municipal, state, and federal), which is about 62% of the developed land and 19% of the total land area. The Town owns many large parcels throughout town, the State of New Hampshire owns the land in Greenfield State Park as well as some parcels in the northeast portion of town, and the federal government owns a very large parcel that borders the Town of Temple which is part of North Pack Monadnock Mountain.

The next greatest use of land is residential, which is approximately 26% of the developed land in Town and about 8% of the total land area. The Town should carefully weigh the implications of an overabundance of residential development as regards its impact on the Town's financial structure. It should be noted that much of the land in Greenfield is either exempt from taxes or under "current use" status. Although there is little doubt that the Town will continue to be a residentially-oriented community, and greatly influenced by existing recreational and institutional uses, consideration should be given to means by which the demands for town services generated by additional residential development can be offset.

The Current Use Taxation program was enacted in 1973 to promote the preservation of open land in the state by allowing qualifying land to be taxed at a reduced rate based on its current use value as opposed to a more extensive use. The minimum land area currently needed to qualify is ten

acres. The price of this favorable treatment is a 10 percent penalty tax (10% of the sale price) when the property is later changed to a non-qualifying use.

In comparing conservation easements to current use taxation, easements are permanent, while current use may be reversed by change to a non-qualifying use and payment of the Use Change Tax. Thus, current use may satisfy the goals of a landowner who cannot afford to permanently abandon future development value, but desires current property tax relief. If it becomes financially necessary to subdivide, the use change tax becomes an element of the development costs.

In Greenfield, the monies collected from the Use Change Tax (10% of the sales price of a piece of land taken out of current use and sold for development) goes to the Conservation Commission for the acquisition of land and/or conservation easements. The Town of Greenfield has a total land area of 16,778 acres, of which 4,904 (29%) are in current use, as of 2003.

The current use designation, authorized by RSA 70-A, provides the town other benefits as well: it encourages landowners to maintain traditional land-based occupations such as farming and forestry; promotes open space, preserving natural plant and animal communities, healthy surface and groundwater; and provides opportunities for skiers, hikers, sightseers, and hunters.

V. LIMITATIONS TO DEVELOPMENT

The data concerning the existing land use pattern reveals that roughly 31 percent of Greenfield's total land area is currently developed, leaving some 11,316 acres undeveloped. Not all of this land, however, is suitable for development. Limiting factors to development include steep slopes, certain soil types, wetlands, aquifers, floodplain areas, and other sensitive lands or features. In addition to these physical constraints, development is limited by the public's desire to protect the quality of life and property values of existing residents. This public will is ideally expressed in the Town's land use regulations, and is the central purpose of this planning document.

Four maps have been created using Geographic Information System technology showing limitations to development in Greenfield: *Stratified Drift Aquifers*, *Steep Slopes*, *Wetlands & Hydric Soils*, and *Development Constraints*. The *Development Constraints* map can be found on the accompanying page. These maps identify seven limitations to development that are related to the ability of the soil to accommodate septic systems, road or building construction.

Limits to Development				
Constraint	Total Acres	% of Total Land Area	Undeveloped Acres	% Undeveloped Area
Total land area	16,778	--	10,987	--
Slopes greater than 15%	5,254.5	31.3%	1,057.1	9.6%
Poorly/very poorly drained soils (Hydric soils)	2,590.7	15.4%	533.3	4.9%
Wetlands	364.2	2.2%	13.1	0.1%

Floodplain	1,036.3	6.2%	149.1	1.4%
Aquifer	5,354.6	31.9%	941.4	8.6%
Shallow to bedrock soils (Less than 40 inches)	3,259.9	19.4%	474.0	4.3%
Shallow to water table (Less than 1.5 feet)	1,069.7	6.4%	1,071.9	9.8%

Source: SWRPC Geographic Information System

Reference to the maps illustrates that one or more of these development constraints exists virtually all over town. There are in fact, only a few areas on the map that appear to have no limitations at all. It is interesting to note that the built up area of the village center is one of the areas in town with few limitations to development which was probably a primary reason why the area was in fact built out. The northern and southern sections of Town have many steep slopes due to the location of Crotched Mountain in the north and North Pack Monadnock Mountain in the south.

In comparing limitations to development to the *Existing Land Use Map*, it can be seen that, while the development does follow almost every road in town, the areas shown as having the greatest constraints have not been developed. How much of this pattern is due to the natural constraints of the land or to other factors such as road access is not known.

Through thoughtful and intelligent planning and zoning, the Town can direct new growth into areas best suited to each class of land use. Through such advance knowledge of what the areas will support in the way of development, Greenfield can consider, in advance, the need for roads, utilities, and community services and facilities.